REMARKS

Claims 1-11, 13, 15, 16, and 21-32 are pending in the present Application. No claims have been canceled, Claims 1, 24, 28, and 30 have been amended, and no claims have been added, leaving Claims 1-11, 13, 15, 16, and 21-32 for consideration upon entry of the present Amendment.

Claims 1, 24, 28, and 30 have been amended to claim an amount of nanosized filler of 0.01 to 30 weight percent, based on the total weight of an insulating layer prepared using the nanosized filler. Support for this amendment can be found at least in the Specification on page 13, ¶ [0043]. No new matter has been introduced by these amendments.

No Previously Presented matter has been introduced by these amendments or Previously Presented claims. Reconsideration and allowance of the claims are respectfully requested in view of the above amendments and the following remarks.

Claim Rejections Under 35 U.S.C. § 102(b)

Claims 1-5, 9-11, 13, 15, 16, 24-28 and 30-32 stand rejected under 35 U.S.C. § 102(b), as allegedly anticipated by U.S. Publication No. 2002/0132898 ("Takaya '898") or U.S. Patent No. 6,908,960 ("Takaya'690"). Applicants respectfully traverse these rejections.

As the application published as Takaya '898 has issued as the US Patent Takaya '690, and as the disclosures of each are substantially identical, Applicants believe for the purpose of the present Office Action that it is unnecessary to address both references explicitly. Therefore, Takaya '690 will be addressed herein as the primary allegedly anticipatory reference, and it will be understood that relevant corresponding portions of Takaya '898 will also be addressed by the above amendments and following remarks.

Takaya '690 discloses a composition comprising a polyvinyl benzyl ether and a ceramic powder or magnetic powder. Col. 5, lines 65-66 and col. 8, lines 19-21.

To anticipate a claim, a reference must disclose each and every element of the claim. *Lewmar Marine v. Varient Inc.*, 3 U.S.P.Q.2d 1766 (Fed. Cir. 1987).

Takaya '690 fails to disclose the amount of nanosized particles claimed in amended claim 1. Takaya discloses that the amount of magnetic powder used is 50 to 90 wt% based on the weights of magnetic powder and polyvinybenzyl ether. Col. 8, lines 31-34. Takaya '690 fails to

disclose the amount of nanosized particles of 0.01 to 30 wt% as claimed in amended claim 1, and clearly discloses use of an amount that is significantly lower than the claimed amount. Further, Takaya '690 discloses that the amount of magnetic powder dispersed in the polyvinylbenzyl ether may be present in an amount of 25 to 65 volume percent (vol%). Col. 11, lines 11-12. The instant claims do not claim a specific vol% of magnetic particles as disclosed in Takaya '690. One skilled in the art will appreciate that magnetic ferrite powders, such as those available commercially, and prepared as they are from iron oxides, will generally have a significantly greater density than carbon-based polymer systems, particularly than non-halogenated carbon based polymers such as poly(viny benzyl) ethers, and that even the lowest value of 25 vol%, when converted to a corresponding weight percentage, would be significantly higher than 30 wt% claimed in the instant claims. For example, commercial ferrites can have densities ranging from approximately 3.7 to 5.3 grams per cubic centimeter (g/cc), values that are significantly higher in density than that of thermosetting polymers, such as polyvinylbenzyl ether, where such polymers may have a density of approximately 1.2 g/cc. From these values, it can be readily estimated that the wt% of magnetic particles using these density values and the disclosed vol% ranges corresponds to a range of approximately 51 to 90 wt% of magnetic particles based on the total weight of magnetic particles and polyvinyl benzyl ether, which is approximately consistent with the weight percentage of magnetic particles disclosed in Takaya of 50 to 90 wt%, and is also well above the weight percentages claimed in the instant claims even when taking into account a reasonable margin of error. Therefore, Takaya '690 clearly fails to disclose an amount of nanosized particles of 0.01 to 30 wt% as claimed in the amended instant claims 1, 24, 28, and 30, and therefore fails to disclose or teach all elements of these claims and their dependents. Accordingly, Takaya'690 and Takaya '898 do not anticipate independent Claims 1, 24, 28, and 30, and their dependents.

Reconsideration and withdrawal of this rejection are respectfully requested.

Claim Rejections Under 35 U.S.C. § 103(a)

Claims 1-11, 13, 15-16 and 21-32 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over U.S. Patent No. 6,800,804 ("Igarashi"). Applicants respectfully traverse this rejection.

Igarashi discloses a resin encapsulating layer formed from an epoxy resin, a phenolic resin, a curing accelerator, and at least one of a conductive particle and/or magnetic particle, the surfaces of which are subject to coating treatment with an insulating inorganic material. Col. 2, lines 40-52.

For an obviousness rejection to be proper, the Examiner must meet the burden of establishing a *prima facie* case of obviousness, i.e., that all elements of the invention are disclosed in the prior art; that the prior art relied upon, coupled with knowledge generally available in the art at the time of the invention, contain some suggestion or incentive that would have motivated the skilled artisan to modify a reference or combined references; and that the proposed modification of the prior art had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *In re Fine*, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988); *In Re Wilson*, 165 U.S.P.Q. 494, 496 (C.C.P.A. 1970); *Amgen v. Chugai Pharmaceuticals Co.*, 927 U.S.P.Q.2d, 1016, 1023 (Fed. Cir. 1996).

Igarashi does not disclose or teach all elements of the invention of the instant claims. As the Examiner has noted in the previous office action, Igarashi specifically discloses that the "average particle size is in a range of 0.5-50 μm (micrometers, i.e., 500 to 50,000 nanometers) are used as the conductive particles and the magnetic particles." Col. 4, lines 36-39 (emphasis added). Claims 1, 24, 28, and 30, each specifically claim a nanosized filler having an average largest dimension of less than or equal to about 200 nanometers.

Igarashi discloses that "[i]t is preferable that particles whose maximum particle size is not larger than 200 μm and whose average particle size is in a range of 0.5-50 μm are used as the conductive particles and the magnetic particles". Col. 4, lines 36-39. The Examiner has pointed out that the particle sizes of *both* the average particle size and upper limit as disclosed in Igarashi are "preferred". Applicants assume by this that the Examiner means that Igarashi is disclosing a particle size limitation in one embodiment, that outside of this embodiment Igarashi does not disclose a particle size limitation, and that therefore it would be obvious to one skilled in the art to use a particle of an average largest dimension of less than or equal to about 200 nm as claimed in the instant claims. If so, Applicants respectfully disagree. Absent a particle size limitation, Igarashi would fail to disclose the limitation of an average largest dimension of less than or equal to 200 nm claimed in the instant independent claims 1, 24, 28, and 30 and would therefore fail to

disclose all elements of the instant claims. In addition, absent a particle size limitation, there would be no teaching to motivate one skilled in the art to utilize a particle of any particular average size. Therefore, Igarashi would fail to teach all limitations of the instant claims, and further would fail to provide a motivation to modify the reference to provide the missing limitation of the instant claims, and for either or both of these reasons would not render the claims unpatentable.

In the preferred embodiment which does disclose a particle size, Igarashi teaches an average particle size of 0.5-50 μm, *and* a maximum particle size of 200 μm. One skilled in the art will appreciate that this teaching mandates by use of the connective term "and" that both conditions of the average particle size and the maximum particle size must be met to effect the teaching, and that these necessary and non-optional teachings cannot be separated and used independently. In other words, in that embodiment, Igarashi discloses that an average particle size of 0.5-50 μm is present, and that the particles of that average particle size range are no larger than 200 μm. The maximum particle size of 200 μm therefore does not operate independently to define all particles below 200 μm, but rather qualifies the particle size range of 0.5-50 μm, and therefore does not teach a nanoscale filler having an average largest dimension of about 200 nm as claimed in the instant claims. The instant claims 1, 24, 28, and 30 claim an average largest dimension maximum of 200 nm, which is clearly not the equivalent of a particle size maximum of 200 μm *and* an average particle size of 0.5-50 μm. Igarashi therefore fails, in this embodiment as well, to disclose or teach all elements of the instant claims. Further, by teaching the combination of the maximum particle size and the average particle size, which is not the average largest dimension of about 200 nm as claimed in the instant claims, Igarashi also fails to provide a suggestion or incentive that the reference can be modified to provide the missing limitation. Thus, Igarashi fails to disclose or teach all elements of the instant claims, and fails to provide a teaching or motivation to modify the above reference to provide the invention as claimed. Therefore, Igarashi does not render the invention of the instant claims unpatentable.

The Examiner has also stated in the Office Action that the upper average particle size of "about 200 nm" is, by use of the term "about", the same to the amount of 0.5 μm (i.e., 500 nm) as disclosed in Igarashi, and that it would therefore be obvious to one skilled in the art to use these amounts interchangeably. Applicants respectfully disagree with this as well. As argued

above, the Examiner has stated no basis for the assertion that one skilled in the art would be motivated to utilize a largest dimension of less than 200 nm as claimed in the instant claims, or for that matter to utilize any particle size smaller than the smallest particle disclosed in Takaya '690 in the range of 0.5 to 50 μm, in light of the above teachings. Applicants maintain that particles of an average particle size of 0.5 to 50 μm (and with a max. size of 200 μm) are clearly and distinctly different therefore from the claimed average largest dimension of less than about 200 nm.

Further, in Applicants' opinion, it would in fact be unreasonable to extend the term "about" as used herein to encompass both dimensions of 200 nm and 0.5 μm and to state that these values are equivalent. MPEP 2173.05(b) teaches that broadening modifiers are acceptable as long as the scope of the claim is clear. One method to determine the clarity of the claim is to assess whether or not one of ordinary skill in the art could readily determine infringement. In *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983) the court held that use of the modifier "about" in the limitation of a range ("exceeding about 10% per second") was definite because infringement would clearly be assessed through the use of a stopwatch. Similarly in the instant claims, the modifier "about" has been employed in the limitation of a range, and particles of an average size of 200 nm or 0.5 micrometers can by clearly assessed through the use of a particle size analyzer employing a method such as, for example, dynamic light scattering, which is capable of resolving average particle sizes of less than a nanometer. Thus the particle sizes are easily differentiated by experimentation and clearly cannot be considered equivalent.

In addition, Applicants assert that nanoparticles are not the same as and cannot be considered equivalent to particles having larger dimension, and that comparing nanoparticles to larger particles should be done from the perspective of one skilled in the art having an understanding of the art of nanoparticles. One so skilled in the art will appreciate that nanoparticles can have unique properties, when compared with larger particles, due to their exceptionally small size approaching molecular dimensions. As is known generally in the art, as the particle size decreases to small (i.e., nanosized) dimensions, bulk properties of the particle can become less predominating in the face of increasing surface properties arising from the increasingly high surface area to volume ratio of the nanoparticles. Electronic and magnetic

properties of nanoscale particles have been found to be different when compared with larger, micrometer scale particles of the same composition. A simple calculation of surface area to volume for a hypothetical spherical particle having a diameter of 0.5 micrometers provides a ratio of 0.012, where the same calculation for a hypothetical spherical particle having a diameter of 200 nanometers provides a ratio of 0.03, which is approximately two and a half times larger. One skilled in the art will readily appreciate the significant difference between these surface area to volume values, and further, will appreciate that the transition of properties from bulk to nanoscale, such as magnetic permeability of nanosized materials, is not predictable. Thus, there is clearly a size difference, surface area to volume difference, and an unpredictable possible difference in properties between particles having average largest dimensions of 200 nanometers and 0.5 micrometers.

It will therefore be appreciated that the average particle size of the conductive and/or magnetic particles disclosed in Igarashi is significantly larger than that claimed in the instant claims, and does not overlap with the average largest dimensions claimed in the instant claims. Igarashi thus fails to disclose or teach all elements of the instant claims as amended, and therefore does not render the instant claims unpatentable. Applicants therefore respectfully request the Examiner withdraw the § 103(a) rejection over Igarashi and allow the claims.

Claims 21-23 and 29 stand rejected under 35 U.S.C. § 103(a), as allegedly unpatentable over Takaya '690 and Takaya '898. Applicants respectfully traverse this rejection

As discussed above, Takaya '690 fails to disclose or teach all elements of the instant claims by failing to teach or disclose the amount of nanosized filler particles in an amount of about 0.1 to 30 wt%. Takaya '690, and Takaya '898 therefore do not make the instant claims unpatentable. Reconsideration and withdrawal of this rejection are respectfully requested.

It is believed that the foregoing amendments and remarks fully comply with the Office Action and that the claims herein should now be allowable to Applicants. Accordingly, reconsideration and withdrawal of the objection(s) and rejection(s) and allowance of the case are respectfully requested.

If there are any additional charges with respect to this Amendment or otherwise, please charge them to Deposit Account No. 07-0868.

Respectfully submitted,

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